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ABSTRACT

This report provides the groundwork for a study of racial balance in San Francisco's public schools. Outlined are patterns which emerged from the experiences other cities had in trying to combat racial imbalance. An overview of interviews with community groups illustrates the priorities such a study should be concerned with in the area of pupil assignment. Alternative plans covering such areas as school attendance boundaries, feeder systems, paired schools, and major school reorganization are individually described and evaluated. Also described are systems for demographic and transportation analysis. Methods and estimated costs for establishing these systems are detailed. A brief discussion of the major demographic trends in San Francisco is presented in an attempt to determine the potential impact of specific projects. In addition, projected costs for various transportation facilities that may be used in achieving racial balance are provided. A schedule for Phase II of the research project is also included. (EB)

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STANFORD RESEARCH INSTITUTE
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July 1966

Interim Report

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RACIAL BALANCE IN THE SAN FRANCISCO UNIFIED SCHOOL DISTRICT--PHASE I

Prepared for:

SAN FRANCISCO UNIFIED SCHOOL DISTRICT
SAN FRANCISCO, CALIFORNIA

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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I INTRODUCTION AND SUMMARY

Introduction

This report contains a discussion of each of the tasks undertaken by the research team during Phase I of the study of Racial Balance in the San Francisco Unified School District (SFUSD). These tasks were:

1. To interview approximately ten community groups that have expressed views on pupil assignment.

2. To make a preliminary determination of alternative pupil assignment plans to be tested and analyzed in Phase II and criteria by which they might be evaluated.

3. To assess data availability for such analyses and to estimate the cost of obtaining necessary additional information.

4. To formulate a program for the remaining work (Phase II).

This report covers accomplishments under the foregoing tasks. A letter proposal on the Phase II study is forwarded separately.

Summary

Stanford Research Institute proposes closer study of five different pupil assignment plans designed to reduce racial imbalance in San Francisco schools.

The plans are ranked in ascending order of expected costs, amount of reduction in racial imbalance, and changes required in school organization and plant utilization.

The five plans are the culmination of Phase I of the SRI study. They are proposed to the SFUSD as worthy of closer study in Phase II, during which each plan will be carefully assessed for the amount of change it will bring about in racial balance, its impact on school organization and practices, and its recurring and nonrecurring costs.

Phase II would include an analysis of the education implications of each alternative and suggestions for programs of implementation for each plan. It is anticipated that, if Phase II can be authorized during August 1966, the work can be completed by May 1967.

As the Phase II study unfolds, it may become apparent that one or more of the plans is not sufficiently feasible to justify a full analysis. On the other hand, new alternatives may be discovered that warrant extensive examination. The team hopes to remain flexible about possible alternatives. The five alternative plans are described below.

Alternative A

Adjust school attendance boundaries to improve racial balance where possible.

Alternative B

Adjust attendance boundaries as above for elementary schools and use feeder system for junior and senior high schools. Each junior high would receive graduates from the three nearest kindergarten to 6th grade (K-6) schools plus the next closest K-6 schools whose racial composition helps offset that of nearby feeders. High schools would be fed by junior high schools in a similar fashion. This plan could achieve almost any desired racial balance from grade 7 on.

Alternative C

The city's 95 elementary schools would be divided into two groups: K-3 and grades 4 to 6 (4-6). Attendance boundaries would be redrawn for K-3 schools to improve racial balance. Graduates of K-3 schools would be fed into 4-6 schools on the same feeder concepts outlined in Alternative B. Junior and senior high schools would also use the feeder system. This plan would offer racial balance possibilities from grade 4 on.

Alternative D

Alternative D focuses on the extremes of racial imbalance. Each elementary school with a high percent nonwhite attendance would be paired with one having a high percent white. Other elementary schools would be treated as in Alternative C. One of the paired schools would take all K-3 pupils, the other one all 4-6 pupils. Junior and senior high schools would be fed by feeder patterns outlined in Alternative B.

Alternative E

Alternative E would involve major reorganization of grade structure to K-4, 5-8, and 9-12 system, with feeder concepts. Boundaries will be redrawn as in Alternative A for K-4 schools. Each 5-8 middle school will have half of its capacity fed by the nearest K-4 schools and the

other half fed by the nearest K-4 schools whose racial composition offsets the nearby feeders. High schools are fed by feeder system outlined in Alternative B. This plan achieves racial balance from grade 5 on.

It is assumed that any pupil assignment plan will be accompanied by education programs that will make it effective. The study team also assumes that compensatory education will continue and be strengthened. It is also assumed that specialized high schools such as Lowell, Gompers, and O'Connell will draw enrollment by admissions criteria appropriate to each.

Each alternative plan will first be assessed by a computer-based assignment model. It will then be reviewed by school principals and classroom teachers and modified so that it will conform to the various criteria. A schedule of meetings will be set up for the study team to present the alternatives and their calculated results. Comments and suggestions will be solicited from District personnel.

It is anticipated that one or more oral presentations of the findings will be made before community groups for the purpose of wide dissemination of information on the alternative pupil assignment plans to be considered by the Board of Education.

The community review of alternatives is expected to take place during February of 1967, and the final report of the Phase II study should be ready about May 1967.

Experience of Other Cities

As part of Phase I, an attempt was made to learn about the experience of other large northern and western cities in pupil assignment to combat racial imbalance. Steps to deal with racial imbalance are relatively recent, and we doubt if it can be said that "solutions" have yet been proved anywhere. Other cities, like San Francisco, are searching for appropriate policies and practices. We found several recurring patterns of actions to diminish racial imbalance in this brief field and literature search. We have drawn on some of these for adaptation to San Francisco. They are reflected in part in the alternative pupil assignment plans that follow. In addition, the two guidelines described below tend to emerge from the review of experience elsewhere.*

1. The trend in percent nonwhite public school enrollment is upward in the central cities of large metropolitan areas. In the last 25 years, the percent Negro enrollments have increased as follows: in New York City, from 8 to 47 percent; in Chicago, from 9 to 51 percent; in Philadelphia, from 14 to 54 percent, and in Pittsburgh, from 14 to 36 percent. The present figure for Washington, D.C., is 91 percent. The increases reflect mainly migrations to the suburbs, differential birth rates, and, to a lesser extent, private school enrollment, as well as southern Negro migration to the North.

2. A number of educational innovations have had the side effect of reducing racial imbalance. These approaches include (a) reassignments to achieve better school plant utilization and (b) grade level (and hence educational) reorganization.

Interviews and Public Meetings

The research team formally interviewed 13 groups to elicit views and suggestions from community spokesmen and to explain the objectives and approach of SRI's study.

More than 100 San Franciscans participated in these discussions. The groups selected included those who appeared to have taken the initiative in presenting their views to the SFUSD Board over the last several years.

In conformity with the Phase I proposal, we did not attempt in these interviews to obtain a systematic survey of opinion in San Francisco on

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* A complete record of this field and literature search is included in the working papers filed with the Board of Education.

pupil assignment. Rather, we sought views on favored patterns of pupil assignment held by a small purposive sample. This effort was intended to help us understand boundaries of acceptable alternative pupil assignment plans and to obtain cooperation in the study from some of those who have been most concerned with the subject in the past.

In analyzing the expressions of community attitude, three clusters of opinion appear especially significant. The Board will have to recognize and to some degree accommodate the implementation of its plans to the legitimate expressions of all three. In general terms, these clusters are represented by organizations with a "civil rights orientation," organizations with a "neighborhood school and property orientation," and organizations with a "minority group neighborhood orientation." Table 1 undertakes to present the thrust of views of each orientation.

The opinions have different kinds of relevance for an evaluation of racial balance alternatives. In the first instance, organizations with a civil rights orientation, especially those that have taken an active role in the racial balance controversy, are generally familiar with the kinds of measures that have been taken in other northern communities to improve racial balance in the schools. We have therefore been able to obtain direct indications of their attitudes toward various techniques that may be used to achieve better balance. In the second instance, organizations with a neighborhood school and property orientation tend to concentrate on the deleterious effects caused by any abrupt change in traditional neighborhood school assignment concepts. These responses have therefore been ordered in categories that reflect these possible consequences. In the third instance, organizations with a racial neighborhood orientation tend to voice specific neighborhood needs and specific criticism of aspects of local education, and the summary in Table 1 is so arranged.

Based on the work to date, it is proposed that the SFUSD Board hold public meetings during Phase II, at which time the SRI research team would present briefings on racial balance studies. These briefings should provide the opportunity for the community to see that all legitimate concerns are being analyzed and accommodated to the fullest extent consonant with quality education, reasonable cost, and the requirements of law; and to provide assurance that the SFUSD Board's implementation plans will minimize individual student dislocations.

The desired effects of such presentations would include:

1. Communication between the SFUSD Board and the community should move from the overpolarized presentation of "demands" to a more affirmative common effort to understand educational needs of all San Francisco children.

Table 1

SOME COMMUNITY VIEWS* RELATIVE TO PUPIL ASSIGNMENT

Civil Rights Orientation

Proposed Measures for Improving Racial Balance	Attitude Range
Geographic and demographic	
Districting	Positive
Educational plant	
Dispersal	Qualified negative to positive (recognized urgent need for plant)
Site selection	Positive
Educational park	Qualified neutral to positive
Educational complexes	Positive to neutral
Grade structure	
Limited grade schools	Qualified neutral to positive
Grade structure reorganization	Positive
Curriculum	
Compensatory education	Positive (but not at cost of integration)
Mobility	
Busing	Positive to neutral (but not if better options are available)
Assignment practices	
Open enrollment	Negative
Permissive transfer	Negative to qualified neutral
Optional transfer	Neutral
Feeder patterns	Positive
Pairing	Positive
Merged attendance areas	Neutral to qualified positive

* The areas of concern indicated in Table 1 are not to be considered as corresponding exactly to the views of any particular organizations or individuals.

Table 1 (continued)

Neighborhood School and Property Orientation

Areas of Concern
Breakdown of neighborhood school concept
Student psychological, social, and cultural adjustment problems
Parental action in emergencies
PTA activities and parent-teacher consultations
Differing levels of student achievement
Transportation difficulties
School-neighborhood rapport
Damage to individual rights by forced integration
Captive children
Coerced parents
Forced flight
Injury to property rights
Tax money spent to attain balance not going for education
Tax money spent to attain balance not being equitably distributed to all citizens
Tax money spent to attain balance lowers school quality and environment, hence downgrades local property value
Nondisadvantaged not receiving a just share of compensatory education dollars
Lowered educational quality
Reduced competitiveness
Retarded classes
Fewer diversified offerings
Inattention to best students
Less capable teachers
Increased disciplinary problems
Inside schools
In school yard during free time
Between home and school

Table 1 (concluded)

Minority Group Neighborhood Orientation

Expressed Educational Needs
Integration needs
No patronizing; recognize equal potentialities of minority students
Provide teachers attuned to minority area conditions
Do not establish or maintain fences
Educational needs
New techniques
More and better equipment
Enriched educational programs
Provide good teachers who stay
Guidance
Provide larger number, more understanding counselors
Recognize and meet educational aspirations of both students and parents
Positive counselor actions toward challenging educational opportunities through positive curriculum guidance and pupil assignment role
Plant and environment
Disadvantaged area schools should be as good as any in SFUSD
Home-to-school safety problems
Special cultural conditions
Special language needs
Special compensatory needs
Special ethnic/racial course enrichment needs

2. Persons attending will constitute a nucleus for the wider dissemination of knowledge about pupil assignment and related educational issues among the San Francisco public.

School Surveys

Toward the conclusion of Phase I, it became clear that the Phase II investigation of alternative procedures for reducing racial imbalance could lead to more solidly based recommendations if a comparative analysis of certain characteristics of the San Francisco schools was carried on simultaneously.

We propose therefore to conduct comparative studies of pupil achievement, class size, teacher experience and qualification, teacher assignment patterns, and budget allocation patterns among selected schools. Limited attitude surveys among parents, teachers, administrators, and pupils may also be undertaken.

Prof. Kenneth Martyn of Los Angeles State College has agreed to serve as our consultant on the design of this part of the study. Professor Martyn was author of the Report on Education to the Governor's Commission on the Los Angeles Riots.

II ALTERNATIVE ASSIGNMENT PLANS

Assumptions Underlying Pupil Assignment

Before outlining alternative pupil assignment plans, some assumptions that underlie all of our proposals for diminishing racial imbalance should be stated:

1. Any assignment plan must be accompanied by the educational programs that will make it effective. If, for example, the plan results in more heterogeneous grouping of student abilities and racial backgrounds, teachers must have the opportunity through in-service training or other means to improve their teaching techniques accordingly. Similarly, if a new feeder plan for pupil assignment permits better articulation and educational continuity as the student moves from elementary to junior high to senior high, machinery must be established to ensure that the improved potential for a cumulative education program is realized. This can be done through a variety of means, including interlevel faculty planning and counseling that is coordinated from one level to the next. Most of these arrangements exist in some form now at SFUSD. They may need strengthening and extension under new pupil assignment patterns.

2. It is assumed that compensatory education will be continued and strengthened under any pattern of pupil assignment. Programs (supported by local, state, and federal agencies) that are now operating in San Francisco will probably be improved as experience is accumulated here and in other cities. Thus far, no fundamental incompatibility has been found between compensatory programs and pupil assignment alternatives. Both programs may become claims on additional District resources, in which event the Board will have to decide what mix of the two is best for meeting District objectives.

3. Pupil assignment changes undertaken to improve school plant utilization or to save unnecessary new construction have generally been accepted in San Francisco and elsewhere. Pupil assignment plans that meet the dual objectives of improving both racial balance and plant utilization are to be sought.

4. Whatever pupil assignment policy the SFUSD Board of Education ultimately adopts will have to be carefully staged in its implementation. If the plan calls for significant structural changes in the SFUSD, such as in Alternatives C, D, and E (see below), it may have to be implemented over a period of several years to avoid disruption in the system and to provide for

smooth and orderly transitions. A variety of staging arrangements will be considered, including:

a. Early and comprehensive changeover.

b. Putting the new assignment plan into effect for only the entering class in each school during the first year of changeover. This arrangement requires more than one year to reach the new planned balance.

c. Making pilot installations in certain parts of the city.

Implementation schedules appropriate to each alternative will be examined and included as an integral part of the plan.

Alternative Pupil Assignment Plans

During Phase II, the Institute intends to examine several alternative plans of pupil assignment. Every effort will be made to estimate the consequences of adopting each alternative. The merit of each alternative in terms of racial balance will be calculated according to criteria discussed later in this report. It is the objective of this research to devise and evaluate plans to improve racial balance in the SFUSD. Thus, a plan is assumed to be superior to another plan or to the status quo if it achieves better racial balance without lowering educational values. The alternatives as now determined are described below; other alternatives, or other combinations of the alternatives below, may evolve in the course of carrying out the Phase II study.

Alternative A: Adjust Attendance Boundaries

Present districting practices will be reviewed to see what boundary changes, if any, will improve racial balance. All territory in a given school attendance area will be simply connected (contiguous).

The principal advantages of Alternative A in comparison with others described below are its minor departure from existing practices and its low cost. Whether A will yield an acceptable improvement in racial balance can be determined only through evaluation and Board review.

Alternative B: Alternative A for Elementary Schools and Feeder Patterns for Junior and Senior High Schools

Under Alternative B, the following rules for attendance at junior and senior high schools will be used:

1. A junior high school will be fed by graduates from the two or three nearest K-6 schools plus the next closest three K-6 schools whose racial composition will balance that of the nearest feeders. (There are approximately six elementary schools for every junior high school. The particular number of elementary schools feeding each junior high school would be adjusted to the latter's capacity.) If the selection of feeder schools for the junior high school is not limited to a given area of the city, almost any level of integration can be obtained.

2. In similar fashion, a given comprehensive senior high school will be fed by the nearest junior high school and the second nearest junior high school whose racial composition will balance that of the first feeder (there are, on the average, two junior high schools for each senior high school).

The advantages of Alternative B include an opportunity for improved educational articulation from one level to another. This derives from all the graduates of a given elementary school progressing as a unit to a specified junior high school, and similarly on to a senior high (with the exception of those admitted to one of the specialized high schools). Present attendance arrangements include enough variations and exceptions to these feeder concepts so that it is not very feasible to plan educational continuity for a specific family of schools united by feeder attendance arrangements. Another advantage of B would be an improved racial balance from grade 7 on.

Disadvantages may include somewhat greater transportation distances for some students in junior high schools, and possibly some school capacity adjustments to minimize exceptions to feeder arrangements.

Alternative C: Grade Level Reorganization--K-3, 4-6, Junior High School, and Senior High School

Under this alternative the 95 elementary schools will be divided into two groups: K-3 and 4-6. The latter will include approximately 30 schools of above average capacity and the more centrally located elementary schools. New neighborhood attendance areas will be drawn for each K-3 school in such a way as to maximize racial balance without departing from the simple connection rule.

The 4-6 schools will serve graduates of K-3 schools under feeder arrangements similar to those in which junior high schools are fed in Alternative B. Another possibility would be for each 4-6 school enrollment to be determined by first admitting students from immediately contiguous city blocks, and then admitting students from the next closest blocks that keep the racial balance of the particular school within specified limits.

Under Alternative C, it may be desirable to let certain elementary schools remain K-6 if their present and projected racial balance is within the limits. Adopting this option would probably save some transportation costs that otherwise would be needed for the new 4-6 pattern, which generally will require a considerable amount of transportation. Naturally, it would be necessary for the 4-6 grade educational offerings in these schools to benefit from whatever educational improvements the new system of 4-6 schools is able to introduce.

Assignment of pupils to junior and senior high schools will be by feeder arrangements designed as in Alternative B. Thus, the racial balance would converge toward the citywide average as higher grade levels are reached.

The potential advantages of C over A and B include its improved racial balance beginning at grade 4 (and thereafter converging toward the city average). An advantage of the grade level reorganization lies in the opportunity to strengthen educational offerings. This is possible from the increased specialization of staff and facilities that could be introduced, which may be particularly important in grades 4-6. Leading practice in these grades is tending to call for increased differentiation of offerings appropriate to individual capacities, more complex teacher deployments through team teaching and other arrangements, and the use of faculty specialists. These advances become economically more feasible in a school that serves fewer grades with more pupils in each grade. Another advantage of C is that all aspects of it are to be found in at least limited use somewhere in SFUSD: "home" schools are K-3; the 4-6 unit is in operation, although for other reasons; and feeder concepts are partially in use.

Alternative C will mean a significant increase in transportation costs over those in Alternatives A and B. Moderate reorganization of the elementary division will be necessary, and plant adjustments and some new construction will be required for grades 4-12.

Alternative D: Pairing of Imbalance "Extremes" for Elementary Schools, Remaining Elementary School Attendance as in Alternative C, and Feeder Patterns for Junior and Senior High Schools

Alternative D recognizes that the extreme cases of de facto segregation at elementary levels may be those deserving priority treatment. In this alternative, each school that has a high percent (say 80) nonwhite will be paired with a school that has a high percent (say 80) white (Princeton Plan). The other elementary schools will be treated as in Alternative C. One of the paired schools will take pupils from both schools for K-3; the other pupils from both schools for 4-6 (or some other grade separation that matches the capacities of the two schools). Since the schools with high imbalances are in the centers of racial residential concentrations, the distances between appropriately matched pairs may be relatively great.

Junior and senior high school attendance will be by feeder arrangements as in Alternative B.

Alternative D offers all the advantages found in C with the major additional feature that extreme imbalances are corrected throughout the system from kindergarten through the 6th grade. The plan imposes the same financial and administrative costs and burdens as Alternative C and, in addition, it calls for interchange of students. This would require a change in stated Board policy.

Alternative E: Grade Level Reorganization to K-4, 4-8, 9-12, and Application of Feeder Concepts

Alternative E will require major administrative reorganization into a primary, middle school, and high school pattern such as the New York City system has recently adopted. Primary schools will serve a neighborhood attendance area, but one whose boundaries will be drawn to achieve as much racial balance as possible. Approximately half of a given middle school's (4-8) capacity will be fed by the nearest primary schools, and the other half by the closest primary schools whose racial balance at least partially offsets that of the nearest feeders. Four year high schools will also be fed as above.

The principal advantages of E include a converging racial balance beginning at grade 5. Also, it permits the offering of a curriculum sequence adjusted to the "middle school" concept, which is attracting support among some educators. In addition, some educators believe that the 9th grade educational offerings are more appropriately linked with a senior high than with a junior high school, as at present.

Since this alternative will involve the greatest departure from present grade level organization, it may also require extensive school facility changes. Under these, it may be appropriate to investigate one or more consolidated educational complexes that would serve either large numbers of middle school students or both middle and high school students.

This plan requires major reorganization at all levels, widespread plant adjustment and some construction, and significant transportation costs.

Table 2 presents characteristics of the five alternative pupil assignment plans.

Evaluating Alternative Assignment Plans

Any plan of assigning pupils to schools, including the existing practices, has both advantages (educational and racial balance effectiveness) and disadvantages (costs and educational impacts). The costs and

Table 2

ALTERNATIVE PUPIL ASSIGNMENT PLANS

	Alternative A (Adjust Boundaries)	Alternative B (A + Feeder Pattern)	Alternative C (3-3-3-3)	Alternative D (Pair Imbalances)	Alternative E (4-4-4)
Attendance					
Elementary	Adjacent (contiguous)	Same as in A	K-3, adjacent 4-6, feeder	K-3, 4-6; imbalances paired, others like C	K-4, adjacent
Junior high school	Adjacent	Feeder	Feeder	Feeder	5-8, feeder
Senior high school	Adjacent	Feeder	Feeder	Feeder	9-12, feeder

other disadvantages measure more or less what we pay, and the effectiveness measures what we receive in return for this payment. Many, but not all, costs are measurable in dollars, but effectiveness is more difficult to measure in monetary units. Nevertheless, some comparison is needed, and this section outlines a suggested method for making such comparisons.

In the case of each pupil assignment pattern discussed in the preceding section, the degree of implementation is somewhat arbitrary, depending on how uniform a racial balance is sought, what costs are to be incurred, and the educational implications. Analysis is therefore needed to show the effectiveness of more than one variant of each plan. The procedure is as follows:

1. Choose low cost, medium cost, and high cost variants of each pattern (i.e., implement the pattern more or less intensively).

2. Calculate the figures of merit and costs listed below for each implementation of the plan. Include the total effect (i.e., racial composition of each school over time).

3. Describe a feasible method of phasing in the plan.

4. State the advantages and disadvantages of each variant (a) educationally (b) administratively.

5. Tabulate the costs involved both to the district and to the pupils.

Since the District's overall objective is to improve racial balance, effectiveness figures of merit should deal with measures of how well each pupil is able to participate in integrated education. Tentatively, the racial balance merit to be used will be biracial, one component of which is white and the other any minority. A criterion based on San Francisco's primarily quadriracial balance (Negro, Chinese, Spanish-speaking, and other) would probably require prohibitive amounts of pupil transportation. Several measures will probably be necessary to make quantitative comparisons among alternative assignment plans. Some, but not all the measures we plan to employ are described below. A figure of merit will need to be calculated for each type of school--senior high, junior high, 4-6, and K-3. In each case, we state the figure of merit in the direction that would make for a superior alternative according to that factor.

1. Minimize the difference between the Districtwide percent nonwhite and the school with: (a) the lowest percent nonwhite and (b) the highest percent nonwhite. These figures of merit may be important in revealing how well each alternative improves the extremes of imbalance.

2. Maximize the number of schools in which the percent nonwhite is within a specified range, say 30 to 70 percent.

3. Maximize the number of students attending schools in which the percent nonwhite is within a specified range, say 30 to 70 percent.

Figures of merit (2) and (3) place emphasis on comparing alternatives according to how large a majority participates in integrated education. Combinations of these three and other figures of merit are possible.

Cost measures will be associated with each alternative assignment plan and its variant. In the following, we state each of some possible cost factors in the direction that would make for a superior alternative according to that factor.

1. Minimize the maximum distance traveled by any kindergartner.

2. Minimize the number of K-3 pupils, or pupil-miles, traveling in excess of one-half mile per trip.

3. Minimize the number of 4-6 pupils, or pupil-miles, traveling in excess of (a) one mile or (b) two miles.

4. Minimize recurring and nonrecurring costs of:

   a. Transportation, whether borne by the District or pupils.

   b. Investment in plant and transportation equipment.

   c. Teachers' aides and traffic control.

   d. Special in-service training programs for teachers.

Measure 1 concentrates on the extremes. Measures 2 and 3 are attuned more to the number of students required to travel beyond a threshold distance. The availability of public transportation and the presence of traffic obstacles will also have to be considered.

Preliminary Analysis of Alternatives C and D

To gain experience that will be useful in Phase II, we made a provisional application of Alternatives C and D to a portion of the city and to the grades through junior high school. In this section, we present measures of effectiveness and costs that would result. The results are partial and illustrative only, since in Phase II, we plan to do this work more rigorously.

One of the community groups recently analyzed the effects of applying feeder concepts for junior and senior high schools in a portion of the city. The group's approach resembles our Alternative B.

Pilot Test of Alternative C

In Alternative C, some school buildings will be assigned a different grade structure from their present ones. In particular, most buildings now serving K-6 will serve only K-3, but some will serve only 4-6. Since both types of schools will serve a larger geographical area, there is expectation that better racial balance will be achieved.

To get an understanding of the problem, the project team studied only a certain section of the city, roughly that served by Presidio, Roosevelt, Franklin, and Marina Junior High Schools in the northern part of San Francisco. The school population in this area is racially representative of the school population in the entire city; there are racially concentrated areas, and some schools with a high Negro and Chinese population. In fact, except for the Spanish-speaking group, the racial composition in this combined district closely matches that of the city as a whole.

Besides the four junior high schools, there are in the area two senior high schools, several parochial schools, and 23 elementary schools. In most of the elementary schools, the racial composition is somewhat unbalanced (see Table 3). The feeder pattern for Alternative C suggested for the northern part of the city is shown in Table 4.

In the assignments shown in Table 4, no junior high school capacity is exceeded. The present capacity of Cabrillo would have to be somewhat enlarged to accommodate the feeder pattern shown. As it happens, construction is already planned in that general area to accommodate the natural increase in school age population.

Certain minor modifications of the main plan explained in Table 4 have also been studied. In one of these modifications, Raphael Weill serves grades K-3, the 4-6 schools in that area being Golden Gate and John Swett. The feeder patterns must therefore be changed for the schools shown in Table 5.

In addition, some 4-6 students from Redding will be transferred into John Swett, and the K-3 capacity will be balanced by adjusting the Redding district boundary line.

Table 3

RACIAL COMPOSITION IN THE ELEMENTARY SCHOOLS
OF THE NORTHERN PART OF SAN FRANCISCO
October 1965

School	Enrollment, K-3							Enrollment, 4-6						
	Total	Negro	Chinese	Japanese	Filipino	Spanish-Speaking	Other	Total	Negro	Chinese	Japanese	Filipino	Spanish-Speaking	Other
Lafayette	448	25	74	44	18	15	272	391	30	64	41	7	17	232
Cabrillo	218	14	58	22	16	16	92	201	7	52	28	3	8	103
Argonne	308	7	103	38	11	12	137	211	8	61	29	7	11	104
Alamo	381	14	31	25	4	10	297	278	7	39	28	3	8	193
Sutro	228	20	35	7	2	3	161	221	9	32	14	10	3	153
Sutro Annex	92	3	18	5	3	2	61	0	0	0	0	0	0	0
George Peabody	228	5	35	16	8	32	132	134	2	31	13	3	11	74
Madison	305	23	30	15	3	6	228	197	11	21	8	0	1	156
Grant	274	24	9	12	4	4	221	258	43	11	11	3	1	189
Frank McCoppin	438	43	100	50	18	13	214	119	10	37	16	4	2	50
Geary	110	18	7	6	5	1	73	81	15	14	9	2	3	38
Anza	247	223	7	1	1	4	11	206	187	3	1	1	2	12
Andrew Jackson	285	202	12	11	4	7	49	168	106	7	4	10	8	33
Emerson	368	313	2	13	1	4	35	86	78	1	0	1	3	3
Golden Gate	421	398	4	3	4	2	10	262	244	4	1	3	1	9
Raphael Weill	463	341	18	26	11	7	60	251	162	23	21	2	3	40
John Swett	298	252	1	5	7	14	19	181	156	5	2	1	7	10
Winfield Scott	151	8	1	1	10	3	128	146	51	1	0	7	6	81
Yerba Buena	137	13	17	0	1	1	105	98	19	13	0	1	0	65
Sherman	183	1	86	0	0	4	92	512	52	121	20	14	49	257
Spring Valley	377	1	337	0	3	3	33	305	2	283	0	2	2	16
Redding	221	30	81	11	0	2	97	171	13	62	9	0	8	69
Commodore Stockton	560	3	523	1	2	4	27	452	0	443	0	1	4	4

Source: SFUSD attendance records.

Table 4

FEEDER PATTERNS, K-3 AND 4-6, FOR JUNIOR HIGH SCHOOLS IN THE NORTHERN PART OF SAN FRANCISCO

Elementary School	Present 4-6 Enrollment	Assigned to 4-6 School/Capacity	Assignments to Junior High School	Number of Pupils Assigned/ Capacity
Lafayette	391	Cabrillo/800*	Presidio	
Argonne	211			
Cabrillo	201 (803)†			
Alamo	278	Sutro/480	Roosevelt	
Sutro Annex	0			
Sutro	221 (499)†			
Anza	206	Anza/540	Presidio	1,393/1,380
Frank McCoppin	119 + 100			
Andrew Jackson	168 (590)†			
Madison	197	George Peabody/410	Roosevelt	911/890
George Peabody	134			
Geary	81 (412)†			
Raphael Weill	251‡	Raphael Weill§/885		
Golden Gate	262§		311 feed Marina	
Redding (not bused from John Swett)	60‡		567 feed Franklin	
Spring Valley	305§(878)†			
Winfield Scott (bused from Emerson)	62	Grant/570	Franklin	1,071/1,050
Grant	258			
Yerba Buena	98			
Emerson	86 (504)†			
John Swett (incl. bused to Redding)	292	Sherman/810	Marina	
Sherman (not bused from Frank McCoppin)	400 (776)†			
Winfield Scott (not bused)	84			
Commodore Stockton‡ (part)		320	Marina	1,407/1,550

* If enlarged.
† Figures in ( ) are subtotals.
‡ Feed Marina Junior High School.
§ Feed Franklin Junior High School.

Sources: SFUSD attendance records. Stanford Research Institute.

Table 5

ALTERNATIVE FEEDER PATTERNS
FOR BENJAMIN FRANKLIN SCHOOL AREA

Elementary School	Present 4-6 Enrollment	Assigned to 4-6/Capacity
Golden Gate	262	
Emerson	177 (439)*	Golden Gate/1,000
John Swett	292	
Raphael Weill	251 (543)*	John Swett/570

* Figures in ( ) are subtotals.

Table 6 summarizes the figures of merit for Alternative C (C1) and for Alternative C with the modification described above (C2).

Lines 1-4 of Table 6 show the cost implications. Distances traveled by most of the students are small, no distance is excessive, and the total number of pupil miles traveled by the young students is very small. Lines 5-9 show some of the effectiveness measures of racial balance. Plan C2 is somewhat less expensive than plan C1, but it is also less effective in improving racial balance.

Pilot Test of Alternative D

The fourth suggested plan for improving racial imbalance in the public schools involves pairing of schools with racially disparate enrollment. Thus, an elementary school with a high proportion of Negro pupils is paired with another elementary school with small Negro enrollment. The attendance zones of the two schools are combined. Students in grades K-3 are transported from one school to the other, and students in grades 4-6 are transported in the reverse direction.

The part of the city chosen for the pilot test was the same part as used for the test of Alternative C. There are five pairs of schools that can be matched in this manner in this area. The members of each pair are on opposite sides of Geary Boulevard; otherwise, schools in each pair are fairly close, as shown in Table 7.

Table 6

EFFECTIVENESS AND COSTS OF ALTERNATIVE C PLANS C1 AND C2

Criteria	Present	Plan C1	Plan C2
1. Maximum distance traveled by a kindergartner	0.8 mile	0.9 mile	0.9 mile
2. Pupil-miles in excess of one-half mile per trip traveled by students in K-3	0	300	300
3. Number of students going more than 1 mile, grades 4-6	0	300	200
4. Number of students going more than 2 miles, grades 4-6	0	0	0
5. Grades 4-6, smallest % nonwhite in any school	20	30	30
6. Grades 4-6, largest % nonwhite in any school	97	85	97
7. Grades 4-6, schools in range 30%-67% nonwhite	13 are 9 are not	6 are 1 is not	6 are 2 are not
8. JHS, smallest % nonwhite in any school	40 (Presidio)	32 (Roosevelt)	40 (Presidio) 57 (Franklin)
9. JHS, largest % nonwhite in any school	95 (Franklin)	80?(Franklin)	83 (Marina)
10. Special costs	Construction postponed 2-3 years	Enlarge Cabrillo, transport some pupils across Van Ness (or take Geary bus), six more buses	(Fewer transported than in plan C1)

Table 7

POSSIBLE PAIRINGS FOR
APPLICATION OF THE PRINCETON PLAN

Pair	Capacity	Distance (miles)	Percent Nonwhite K-3	Percent Nonwhite 4-6	Enrollment K-3	Enrollment 4-6
Andrew Jackson	480*	0.9	70%	%	395	
Geary	285			71		249
Anza	540	1.5	57		522	
Madison	510			59		403
Golden Gate	1050		67		695	
Grant	570	1.3		62		520
Raphael Weill	885†		72		600	
Yerba Buena	345	1.2		70		349
John Swett	570*		77		481	
Sherman	810	1.3		60		693

* Temporary capacity including bungalows.
† Additions to this school capacity are being contemplated.

In each case in Table 7, the result is that racial balance is favorably affected by the pairing. All capacities are adequate, but transportation would be needed to implement this plan.

III DEMOGRAPHIC ANALYSIS AND PUPIL TRANSPORTATION

To proceed in Phase II with the analysis of the five alternatives, we must obtain large quantities of reliable data and reduce them to usable form. Also, since some of the alternatives call for varying degrees of transportation, reliable information on transportation costs and availability must be secured and put into a form that will permit transportation implications of each plan to be viewed clearly.

The sections that follow describe the efforts made in Phase I to establish systems for demographic and transportation analysis.

Demographic Analysis

As a part of Phase I, an effort was made to gain an understanding of the major demographic trends in the city and their implications for policies on racial balance in the school system. This effort also included surveying available sources of data and the cost and methods of making a short run projection of the school age population in the city. No original data were collected during this phase of the study. The following section presents a brief discussion of the major demographic trends in the city. The proposed method and cost of preparing the population projection are included in the second section.

Demographic Trends

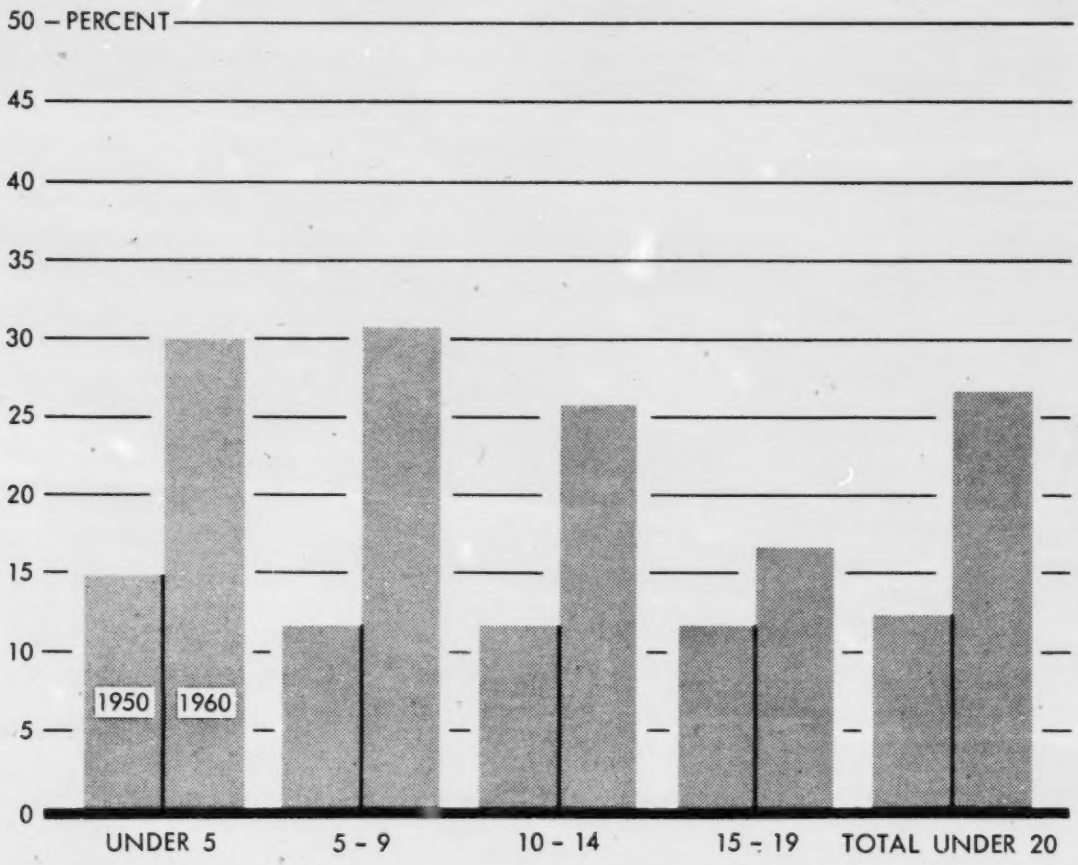
According to the U.S. Bureau of the Census, from 1950 to 1960, total population in the city declined by 4.5 percent. The white population declined by 89,485, while the nonwhite population increased by 54,444 persons. In 1960, 18.4 percent of the total population was classified as nonwhite.

Evidence indicates that the trend is continuing into the 1960s. The Bureau of the Census estimates that by July 1, 1964, the total population of the city had declined to 731,000 and to 723,000 by July 1, 1965. The California Department of Finance, while estimating a total population of 750,000 on July 1, 1965, estimates that the nonwhite population had increased to 22 percent of the total population.

The shift in the racial composition of the city is reflected in the increase in the percent nonwhite in the lower age groups (see Figure 1). In 1950, approximately 13 percent of all persons under 20 years of age were classified as nonwhite. In 1960, 27 percent of this group was nonwhite. The greatest change occurred in the 5 to 9 age group where the percent nonwhite increased from 12 percent in 1950 to 31 percent in 1960.

FIGURE 1

PERCENT NONWHITE BY AGE GROUP FOR
1950 AND 1960



SOURCES: U.S. Bureau of the Census. Stanford Research Institute.

The higher concentration of nonwhite persons in the lower age groups is also illustrated in the school enrollment data provided by the San Francisco Unified School District (see Table 8). Approximately 43 percent of the public school enrollment is classified as nonwhite. Pupils with Spanish surnames account for 11 percent of the total enrollment, and nonwhite and Spanish surnamed pupils combined account for approximately 54 percent of the total enrollment.

An indication of future change is the fact that the proportion of Negroes and persons with Spanish surnames is substantially higher in the lower school grades than in the upper, while the situation is reversed for the group classified as other, which is essentially the white population. If each grade level moves up through the school system, Negroes and persons with Spanish surnames will significantly increase their proportion of the total enrollment in the public school system. Note that, in addition to racial composition of the population, these figures represent net change and do not reveal the cause of that change. For example, some of the change in racial balance may be attributed to differential dropout rates. In Phase II, an effort will be made to explore further the cause of these changes. In any event, this upward movement through the system, together with the higher birth rates for the nonwhite population and continued net outmigration of the white population, indicates that the process of change in the racial composition of the entire school system is quite likely to continue into the 1970s.

Another important consideration is the spatial distribution of racial groups throughout the city. In 1950, the population of 7 percent of the Census tracts in the city was 50 percent or more nonwhite. By 1960, the former figure had increased to 14 percent. If we consider only the population under 20 years of age, the corresponding figures for 1950 and 1960 are 15 and 27 percent.

Urban redevelopment is another factor to be taken into account when assessing likely shifts in the distribution of the city's population. Information provided by the San Francisco Redevelopment Agency indicates that, within the next five years, approximately 6,370 families will be directly affected by the redevelopment program. The impact of specific projects is presented in the tabulation below.

Project	Number of Families Affected
Western Addition A-2	1,250
Yerba Buena Center	250
Hunters Point	1,800
Mission Street	2,800
Total	6,100

Table 8

RACIAL COMPOSITION OF SAN FRANCISCO
PUBLIC SCHOOL SYSTEM
(Percent)

Grade	Negro	Chinese	Japanese	Filipino	Spanish-Speaking	Other*
K	26.4%	9.6%	1.6%	3.2%	13.3%	45.9%
1	30.1	10.7	1.6	2.6	12.6	42.4
2	30.0	11.7	1.7	2.5	12.5	41.7
3	30.0	11.8	2.2	2.8	11.7	41.6
4	28.7	13.2	2.2	2.4	12.5	41.0
5	27.8	12.2	1.9	2.5	11.6	44.0
6	26.8	13.5	1.8	2.7	11.1	44.1
7	26.8	12.7	1.8	2.0	11.0	45.7
8	26.0	12.7	1.7	2.0	10.7	47.0
9	23.1	14.1	1.6	2.2	11.8	47.2
10	22.0	15.8	1.4	2.3	10.6	47.9
11	18.2	18.6	1.7	2.7	9.3	49.5
12	16.0	16.8	2.2	2.5	7.1	55.4
Total city	25.6	13.3	1.8	2.5	11.3	45.5

* The category Other is primarily composed of the white population.

Source: San Francisco Unified School District, Selected Data For Study in the Challenge to Effect a Better Racial Balance in the San Francisco Public Schools, November 1965.

Not all of these families will be relocated from the project area. Some may continue to reside in their immediate neighborhood. During Phase II, an effort will be made to determine more precisely the implications of these projects for the distribution and racial composition of the population in San Francisco.

Phase II Demographic Analysis

The primary objective of this portion of the research proposed for Phase II is to project school age population by age group and race for each Census tract in the city of San Francisco. This includes estimation of the shift likely to occur over the next five years in the distribution of the nonwhite population in the city. This information will provide data necessary to estimate the future requirements of any program designed to improve substantially the racial balance in the school system.

Because the alternatives to be studied are relatively sensitive to future population composition, accuracy of the projection is essential. Since projections far into the future, while desirable, are bound to be less accurate than those for shorter periods, the projection will be restricted to a relatively short period of four to five years. Restricting the projection to the short run permits the use of time series data on population from the Census and from school enrollments requiring little adjustment.

The basic approach recommended for this study is the cohort survival method. Through this method, the population is grouped into five-year age groups, or cohorts. Each cohort is sequentially moved ahead into the next age group. This process requires estimates of survival rates and the net effect of migration on the number and racial composition of each age cohort. Changes in racial composition will be estimated by computing rates of change from 1950 to 1960 from Census data and from 1960 to 1965 from Census and school enrollment data. These rates will provide the basis for making assumptions on the rate of change likely to occur in the school age population over the next five years.

The tabulation below illustrates the application of the cohort survival method.

Age Group	1950	1960	1965	1970
Under 5	000	000	XXX	
5-9	000	000	000	XXX
10-14	000	000	000	XXX
15-19	000	000	000	XXX

The zeros represent actual population counts from the Census and from school enrollment data. The Xs represent estimates of natural increase and the effects of net migration.

Sources of Information. Sources of information for the demographic analysis in Phase II include:

1. Census reports for 1960 and 1950--The Census reports for 1950 contain counts of the white and nonwhite population by age group at five-year intervals by Census tract. The information is limited to those tracts with more than 400 nonwhite persons. The 1960 Census provides counts of the number of persons with Spanish surnames as distinguished from the rest of the white population.

2. Racial census taken by the San Francisco Unified School District--The racial census contains counts of the number of students according to a specified racial breakdown. The name, address, birth date, and race of the pupil are recorded. This information will be placed on punch cards and tabulated according to age of the pupil, and the census tract and block number will be related to the pupil's address.

3. Racial census to be taken in the parochial school system by the Archdiocese of San Francisco--This census will contain information comparable to that provided by the racial census taken for the public school system. The only difference is that the parochial system's data will be recorded as of May 1966 rather than as of October 1965 as is the public school census.

4. Births and deaths--Information on births and deaths since 1960 is available from the public health records on vital statistics.

Anticipated Results. The final product of this effort will be an estimate of the school age population by Census tract. This effort will also provide insights into the block-by-block distribution of the school age population in 1971 and facilitate the analysis of the effectiveness of various pupil assignment programs over the next five years.

Pupil Transportation

Excepting possible long run changes in residential living patterns that may solve the problems of school integration, there is little doubt that any program of pupil assignment that envisions substantial improvement

in racial balance in the immediate and intermediate periods will require an expanded system of pupil transportation. At present, a large portion of the pupils in junior and senior high schools use public transportation to attend school. An estimated 32,000 public and private school pupils use public transportation for daily trips to school. About 1,600 elementary pupils are transported daily by the school district. These movements are made primarily because of school capacity problems, and not for purposes of integration. The 1,600 elementary pupils are being transported by the Municipal Railway under contract with the Board of Education. The cost per pupil is high, about $100 per year, and the capacity of the Muni to handle additional pupils is limited.

Accordingly, it is both desirable and necessary to explore alternative means of expanding pupil transportation in the San Francisco school system. Basically, there are three methods that may be employed, either singly or in combination: (1) expand the existing system of contracting with the Muni or arrange attendance zones so that regularly scheduled public transportation can be used by elementary school pupils, (2) purchase buses and operate a district transportation system, or (3) lease buses.

Costs of a District-owned Transportation System

Because San Francisco has unique characteristics in terms of size, population density, and problems of terrain, precise costs cannot be determined on the basis of other districts' experiences. Nevertheless, such experience can be used to provide a first approximation of transportation costs. Detailed information on costs for seven large suburban districts, obtained from reports in the files of the State Department of Education, is recorded in Table 9. The weighted average of operating costs per bus-mile for these districts is $0.51, which covers all operating costs for regular school bus transportation, but excludes special costs of transportation for handicapped pupils and driver training expenses. It also does not include an allocation of capital costs, which will be discussed later.

Costs of a San Francisco system may be somewhat higher than this average for two reasons. First, the weighted average of salaries per driver for the group of districts was $3,680 per school year. If the district must hire union employees for a guaranteed eight-hour day at a wage of $3.75 per hour (which will be the driver wage for the Municipal Railway in 1967), the cost per driver for San Francisco may be as high as $5,400 ($3.75 x 8 hours x 180 school days) for a large portion of the drivers. For example, if half the drivers work at the higher wage, and the other half work at the average wage for the seven districts, driver costs would be 23 percent higher for San Francisco, and the costs per mile would rise to $0.60. Second, the hills and traffic in the city may increase the fuel and repair costs of a vehicle above that incurred in the suburban districts. If these costs are one-fourth higher than the average for the group, the cost per mile would rise to $0.63.

Table 9

TRANSPORTATION COSTS FOR SEVEN CALIFORNIA UNIFIED SCHOOL DISTRICTS
1964-65

	San Juan, Sacramento County	Elk Grove, Sacramento County	Azusa, Los Angeles County	Folsom Joint, Sacramento County	Fremont, Alameda County	Mt. Diablo, Contra Costa County	Orange, Orange County
Salaries	$ 366,300	$150,300	$ 72,000	$ 94,300	$197,200	$ 321,600	$156,000
Avg. per employee	(3,360)	(3,260)	(5,538)	(3,490)	(4,100)	(3,739)	(3,540)
Payroll burden (work comp., OASDI, returned)	30,200	13,300	7,400	7,000	21,400	24,000	12,600
Insurance	13,100	6,700	1,800	4,000	3,800	5,700	5,200
Repairs and materials	32,900	22,200	5,400	13,800	26,800	19,900	6,600
Gas, oil, grease, tires, and miscellaneous	72,100	25,100	8,600	22,300	31,700	44,200	18,600
Contract costs	--	17,200*	7,800†	--	--	106,200‡	1,950
Total	$ 514,600	$234,800	$103,000	$141,400	$280,900	$ 521,600	$200,950
Number of pupils	19,939	4,306	1,923	2,493	7,533	10,590	4,118
Number of buses	113	41	12	19	35	105	31
Number of employees	109	46	13	27	48	86	44
Miles traveled	1,084,000	600,700	138,400	308,800	431,700	1,211,500	338,800
Home to school	1,012,700	593,700	107,700	n.a.	419,700	1,026,500	313,900
Number of bus-days	18,900	6,727	2,312	3,309	5,712	16,195	5,117
Avg. hrs per bus-day	4.52	6.2	4.25	6.58	5.8	5.5	4.93
Avg. size of bus (rows of 6 pupils each)	10.29	10.6	11.76	10.58	9.9	9.21	12.3
Number of buses 10 rows or more	85	30	n.a.	16	25	n.a.	27

Table 9 (concluded)

	San Juan, Sacramento County	Elk Grove, Sacramento County	Azusa, Los Angeles County	Folsom Joint, Sacramento County	Fremont, Alameda County	Mt. Diablo, Contra Costa County	Orange, Orange County
Cost per bus-mile	$ 0.475	$ 0.391	$ 0.744	$ 0.458	$ 0.655	$ 0.436	$ 0.593
Cost per bus-day	$27.24	$34.92	$44.54	$42.77	$49.55	$32.65	$39.26
Cost per pupil	$25.58	$54.56	$53.55	$56.77	$37.56	$49.93	$48.78
Miles per bus-year	9,600	14,650	10,600	16,250	12,300	11,500	10,900

* Six drivers, 176 days X 3 hr per day.
† One 60 passenger bus, 178 days X 6 hr, 23,000 miles.
‡ Forty-one contract buses.

In addition to operating costs, there are the capital costs of the equipment. The cost of buses is the major element. There are two distinct categories of buses: the school bus, which costs about $8,000, and the transit bus, which costs between $20,000 and $25,000. Most of the larger urban and suburban districts are currently purchasing transit buses with capacities of 78 to 90 pupils. The state aid formula permits depreciation of buses to zero in 15 years; thus, a cost per year of about $1,500 must be added to cover the capital costs of each bus. An additional amount, assumed to be equivalent to $500 per bus, should also be added for buildings, parking lots, and other equipment.

Costs per bus-day and costs per pupil can only be determined on the basis of the actual routings. In Table 1, for example, note that two districts with the same costs per bus-mile have very different costs per bus-day and per pupil despite the fact that their buses have the same size mix. The average distance traveled per year by a busload of pupils in the San Juan District is 3,360 miles, whereas the average distance in the Folsom District is 7,877 miles; thus, costs per pupil are over twice as high in the Folsom District. In San Francisco, bus distances will be relatively short, which will permit use of combination pickup, and, in general, result in a relatively low cost per pupil, despite higher costs per bus-mile.

Bus Leasing

It may be possible to lease a large number of buses from one of the major bus operating or leasing companies, such as Martinez Bus Line, AC Transit, or Gillig and Company. Whether a sufficient number of buses could be acquired from these companies would have to be explored directly with the company. Investigation indicated three types of existing arrangements: (1) leasing of a bus for an eight-hour day with driver at a cost of $40 per day, with additional charges of $0.50 per mile over 40 miles; (2) leasing at $3.50 per hour plus $0.40 per mile, with charges portal to portal; or (3) leasing a bus without driver at $15 per day, plus $0.25 per mile, not including gas. None of these arrangements will result in costs that are below those obtainable by an efficiently run District transportation department, but such an arrangement may be desirable if the District wishes to avoid the aggravation of running such a department. The District would be required to handle scheduling of busing, and therefore would incur some supervisory and administrative costs over and above the cirect busing costs quoted above.

Expanded Use of the Municipal Railway

Expanded use of the municipal system may take one of two major forms: (1) expansion of the present system of contracting or (2) use

of regularly scheduled municipal transportation for elementary school pupils. In 1964-65, the SFUSD contracted for the daily transporting of approximately 1,600 pupils. Charges were made to the District on an hourly basis at a rate of $10 per hour, with a minimum charge of one hour. Thirty-one buses were used for the morning trip, with 19 of them at the minimum rate. In the afternoon, 33 buses were used, several making two trips, and only one at the minimum rate of one hour. Travel time is calculated from the point at which the bus leaves its regular run to the time that it returns. Thus, a school-to-school trip of 20 minutes often results in time charges of one and one-half or two hours, because of the elapsed time in moving between line and schools. The total actual costs to the SFUSD in 1964-65 were $160,000 for transporting 1,619 pupils, or $99 per pupil.

Expanding the existing arrangement would undoubtedly raise the per pupil costs. The Muni claims to have almost exhausted its ability to use on-line buses. Thus, additional buses would be mainly those not in operation at the time, requiring use of extra drivers. The minimum charge for a bus that must be taken from the station is $20, rather than $10 if diverted from a scheduled run. In addition, it will be harder to arrange for the diversion of buses that are reasonably close to the schools for which transportation is required. Thus, the elapsed times for diverting on-line buses will probably increase with increased use of Muni buses. Even if the SFUSD is prepared to pay the high costs of using the Muni buses on a contract basis, the possibilities for expansion are limited.

It may be possible to extend the use of regular public transportation to elementary pupils. At present, junior and senior high school pupils use public transportation for home to school trips, but most elementary pupils are within walking distance of school, or are transported at the expense of the District. It is quite possible for elementary school pupils also to use public transportation for home to school trips, especially if the receiving school is on an existing route and transferring is not required. At present the student fare is 5 cents per ride, or $18 per school year. This is much lower than any alternative system of district transportation.

The cost of 5 cents per trip, however, does not reflect the real costs of using public transportation. In those cases where additional transportation of pupils necessitates adding equipment to the runs, the costs per pupil will be much higher. At present, the operating costs per revenue passenger for the Muni system is about 20 cents. The marginal costs to expand operations is about 75 percent of total operating costs, since some costs such as maintenance of ways and stations, administrative overhead, and sales expenses would not be substantially increased. On the basis of marginal costs of expanded operations, the cost per pupil to the city of San Francisco (regardless if paid by the Muni, the SFUSD, or the pupils) would be about $54 (15¢ x 2 x 180), or roughly equivalent to the costs of a District-owned system. The actual

cost, however, may be more or less than this amount. If use can be made of existing excess capacity, as would be the case if pupils were to ride the buses against the direction of commuter flow in the morning peak periods, then marginal costs may be almost zero for such pupils. On the other hand, if the expanded operations required the purchase of additional buses by the Muni, the long run costs are considerably above the marginal costs of operations, as they would also include capital costs of new equipment. Consultation with the Muni agents as to which movements would require additional equipment and which would make use of existing excess capacity is required before a final estimate of costs can be made.

Tentatively, it may be concluded that if a significant expansion in pupil transportation is being considered, the establishment of a District-owned transportation system is as economical as any of the other alternatives. For purposes of this first phase investigation, we use the following figures to represent transport costs, where vehicular transportation is required:

Fixed costs per bus = $2,000 per year
Added costs per bus-mile = $0.63

To cover inflation and increases in wage rates, the costs per bus-year and per bus-mile should be increased at about 3 percent per annum, so that the cost schedule for the period 1967-71 would be as follows:

	1967	1968	1969	1970	1971
Fixed cost per bus*	$2,000	$2,060	$2,120	$2,185	$2,250
Cost per bus-mile	0.63	0.65	0.67	0.69	0.71

* For capital expenditures in that year. Thus, if all equipment is purchased in 1967, the 1971 costs would be $2,000 + $0.71 per mile.

IV EVALUATION MEETINGS AND SCHEDULE FOR PHASE II

Evaluation Meetings

From demographic and cost information and a computer based assignment model, the research team can prepare a first evaluation of the alternative pupil assignment patterns. However, the alternatives must be subjected to careful review and necessary modification by school principals and classroom teachers.

We therefore propose that as soon as the results of the calculations become available, the Assistant Superintendent for Human Relations organize a series of meetings for about ten groups of District personnel. Present would be each school principal, or his designated human relations representatives, and one or more teachers from each school. Ten groups are suggested so that attendance at each session can be kept small enough to permit participation.

The research team and District administrative personnel would meet twice with each of the ten groups. At the first meeting, the team would brief participants on the alternatives and their calculated consequences. Designated school personnel would be invited then or later to offer comments or suggestions, particularly those needed to adapt the plan to a particular school or area. The second meeting would take place about a month after the first. It would provide an opportunity for District personnel to make additional suggestions, and for the research team to respond as to how the plan might incorporate needed modifications.

After the series of meetings with District personnel, the District's Human Relations Office and the research team should make one or more oral presentations of findings before community groups, possibly in special board meetings called for this purpose. Most modifications that can be incorporated in the several plans will have been made following the District review. Therefore the main objective of the community meetings will be wide dissemination of information on the alternatives to be considered by the Board of Education.

Schedule for Phase II

The timetable for accomplishing the remaining steps is given in Table 10.

Table 10

SCHEDULE FOR PHASE II

Date	Step
August 1966	Process pupil records Program model
September 1966	Demographic data on school population School plant capacity Transportation data --all to computer
November 1966	Evaluation of alternatives
December 1966	Performance, facility, personnel, and attitude surveys completed First district review of evaluation
January 1967	Second district review Recycle evaluation of alternatives
February 1967	Community reviews of alternatives Draft report
March 1967	Other reviews Edit report
April 1967	Final report submitted